MERCER COUNTY BRIDGE No. 2631
Spanning Pine Run at Cribbs Road
Mercer Vicinity
Mercer County
Pennsylvania

HAER No. PA-225

PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

HISTORIC AMERICAN ENGINEERING RECORD
National Park Service
Northeast Region
U.S. Custom House
200 Chestnut Street
Philadelphia, PA 19106

HAER
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HISTORIC AMERICAN ENGINEERING RECORD
MERCER COUNTY BRIDGE NO. 2631 HAER No. PA-225

Location: Spanning Pine Run at Cribbs Road approximately 300 feet south of the junction of Cribbs Road and Road T-403
Mercer vicinity
Mercer County, Pennsylvania

USGS Mercer, Pennsylvania Quadrangle,
UTM: 17.568100.4560160

Engineer: Unknown

Builder: Unknown

Date of Construction: Circa 1894

Present Owner: Mercer County Commissioners

Present Use: The single-lane bridge presently is open to vehicular traffic but is restricted to a three-ton load limit. The structure is scheduled for removal and replacement.

Significance: The single-span Mercer County Bridge No. 2631 represents an unusual example of bridge construction using railway iron. Although information provided by the Mercer County Bridge Department suggests that these rails were incorporated into the bride's superstructure during the recent past, several local informants indicate that the bridge has changed little during the last 50 years (Holland, E., and H. Thompson, personal communications 1993). Although the bridge manufacturer is unknown, the structure closely resembles a bridge design patented by the Lane Bridge Works of Painted Post, New York, which specialized in the fabrication of metal truss bridges using railroad iron from circa 1890 to 1901 (Darnell 1984). Although the Lane design was technologically crude, it could easily be fabricated by small companies with a minimum of equipment. Few examples of the Lane Bridge survive; these include the 1892 bridge at Park's Gap, West Virginia, a bridge at McDowell, West Virginia, and three in upstate New York (NRHP 1978). The use of railway iron in bridge construction is rare both in Mercer County and western Pennsylvania.

Despite its unusual form of construction, Mercer County Bridge No. 2631 is typical of the many small-scale rural bridges built throughout Pennsylvania and other states during the late nineteenth century to facilitate the movement of goods and raw materials between rural and urban sectors. These bridges contributed to the integration of small rural communities like Hope Mills and Blacktown within the region's expanding economic system.

Project Information: This documentation was conducted on behalf of the Mercer County, Pennsylvania Bridge Department, Mercer, Pennsylvania, in April, 1993. The recordation was conducted as a mitigative measure, prior to the removal and replacement of the existing Mercer County Bridge No. 2631.

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PART 1
HISTORY OF MERCER COUNTY BRIDGE NO. 2631

Mercer County Bridge No. 2631 is located in a thinly settled rural area along Cribbs Road in Findley Township, Mercer County, Pennsylvania. The bridge is situated two miles east of the settlement of Hope Mills, approximately 300 feet south of the junction of Cribbs Road and Road T-403. The bridge spans Pine Run, a tributary of Neshannock Creek. Although no bridge plaque or original design drawings survive to establish the actual date of construction, Mercer County Bridge dockets indicate that construction of the original bridge was authorized on July 7, 1893 (Mercer County Bridge Department 1992). According to an April 19, 1895 Supplement to the *Mercer Dispatch and Republican*, monetary disbursements for two separate iron bridges across Pine Run in Findley Township were authorized in 1894. These were in the amounts of $170.00 and $333.00. The *Supplement* also records the disbursement of $345.00 for bridge stonework across Pine Run. Although it remains unclear which of these references relates to County Bridge No 2631, they do support an 1894 construction date for the bridge.

Mercer County Bridge No. 2631 was built during the period when local transportation was based mainly on horse and wagon. Early Euroamerican settlement in the region dates back to 1799, when Christian Troxel settled near Mill Creek near the northern township boundary. During the same year, John Findley migrated from Westmoreland County to settle in present-day Mercer Borough (Brown, Runk & Co. 1888:526-527). Early settlement in the township vicinity was stimulated by the area's fertile soils, abundant timber, and the availability of hydropower from Neshannock Creek and its many tributaries. Like other sections of Mercer County, this early settlement occurred in locations favorable to agriculture and timbering, and self-sufficient farms comprised the main form of settlement during the early decades of the nineteenth century.

Grist and saw mills represent the earliest industrial undertakings by the early settlers of Mercer County. By 1800, several such mills were in operation across the county. These include a hewed log mill built by Jacob Loutzenhizer along Pymatuning Creek near present-day Orangeville in 1798, and a grist mill constructed in 1798 along Wolf Creek near Pine Grove (later Grove City) by Valentine Cunningham. The following year, Peter Wilson built a mill along Mill Creek in Jackson Township, several miles northeast of the present site of Mercer County Bridge No. 2631 (White 1909:47,50). Early grist and saw mills in Findley Township include John and Joseph Junkin's 1805 grist and saw mill along the banks of Neshannock Creek. A fulling and carding mill was subsequently established on Junkin's property. These mills were situated about two miles west of Mercer County Bridge No. 2631. Known during the early decades of the nineteenth century as the Hope Farm, this tract was later named Hope Mills (Brown, Runk & Co. 1888:527-528; White 1909:50-51). In 1803, another grist mill was established by David Courtney along present-day Route 258, approximately one mile west of the bridge location.

During the 1830s, the local economic emphasis on lumbering and agriculture shifted toward technologically more complex endeavors due to Pittsburgh's growing regional importance as a major economic and transportation center. The increasing inability of Pittsburgh's early iron manufactories to meet the burgeoning demands for iron during this period resulted in the establishment of numerous smelting furnaces throughout southwestern Pennsylvania and Mercer County. This trend was augmented by the area's plentiful natural resources, including local ore, limestone, and high grade Mercer County coal. For a time, Mercer County produced what was considered to be some of the best pig iron in the world (Mercer County Regional Planning Commission, 1977: 3; Hutchison 1967: iii and 7-11). The

county's earliest iron furnace was established in 1837; the increased demand for locally produced iron resulted in the construction of the Clay and West Middlesex Furnaces in 1845, and the Big Bend, Esther, Greenville, Hamburg , Sharon, and Sharpsville Furnaces in 1846. The county's nascent iron industry was stimulated by improvements in local and regional transportation, most notably the Erie Extension Canal (1840-1870), which after 1853 facilitated the economical shipment of Lake Superior ore into southwestern Pennsylvania and Mercer County. The Extension Canal stimulated the early industrialization of the Shenango Valley, and contributed to the growth and industrialization of Clark, New Hamburg, and Big Bend. The iron industry in southwestern Pennsylvania was further stimulated by a protective tariff which promoted local and regional enterprises.

Although the region's iron industry entered a period of general decline following the repeal of the tariff in 1848, and was especially hard hit by British dumping of iron onto the American market (Hutchison 1967: iii and 7), the net value of the iron manufactories in Mercer County grew from $253,000 in 1860 to $2,439,311 in 1870. During this period, many of the towns which had prospered along the canal entered a period of stagnation, when the economic importance of the canal was superseded by the newly established Pittsburgh and Erie Railroad. Consequently, many of the smaller canal-based towns were unable to compete economically with settlements along the new railroad lines (Mercer County Regional Planning Commission, 1977: 2-4).

A 1873 G. M. Hopkins map of Findley Township examined during this recordation depicts the immediate project vicinity as a small hamlet comprising several structures near the junction of Cribbs Road and Road T-403 during the last quarter of the nineteenth century. Cribbs Road is shown near the property of P. Cribbs. According to genealogical records, Peter Cribbs arrived from Westmoreland County, Pennsylvania in 1825 and established a farm in the immediate vicinity of the project area (Hettenbach 1935). Several hundred feet south of the bridge, the map depicts a schoolhouse and adjacent property associated with P. Cribbs. The buildings shown on the 1873 map include several unidentified structures west of the bridge location along Road T-403; an evangelical church immediately northwest of the junction of Cribbs Road and Road T-403; a structure immediately southwest of the bridge location; and a building associated with an "R. Thompson" to the northeast. The schoolhouse reportedly operated until the area's schools were consolidated during the late 1940s (E. Thompson, personal communication 1993).

The 1873 map does not show any graphical representation of a bridge across Pine Run in this area, and no specific historical information about earlier crossing structures at the bridge location was found during this project. The map suggests that the present day segment of Cribbs Road near the bridge has changed little from its mid to late nineteenth-century alignment. During the late nineteenth century, Cribbs Road formed part of a main route connecting nearby rural farm settlements with the Mercer & Butler Turnpike (today Route 258) and the village of Pardoe, situated to the northeast. Established as a company town by the Mercer Mining and Manufacturing Company in 1869, Pardoe served as the headquarters for the company's efforts to exploit the region's high-quality *Clarion* coal deposits. These efforts were facilitated during the same year by the establishment of the Shanango & Allegheny Railroad (later the Pittsburgh, Shenango & Lake Erie Railroad) in Pardoe (Brown, Runk, & Co. 1888:204). Coal was an important local economic resource near County Bridge 2631; according to the 1873 map, several coal mines were in operation in the general vicinity of the bridge location during the late nineteenth century; including two mining locations north of the bridge location and west of the Harrisville Road (today Route 58).

Mercer County Bridge No. 2631 is situated several hundred feet south of an atypically large and elegant nineteenth-century dwelling. According to its present occupant, this circa 1870 house was associated with a Samuel(?) Gailey, who was identified by various informants as a banker or an

oilman associated with Colonel Edwin Drake's pioneering enterprise in Titusville, Crawford County. (A. Bollinger and E. and H. Thompson, personal communications 1993). The ruins of an early hydroelectric generator and associated water channel are located approximately 50 feet south of the bridge; these reportedly were built during the early twentieth century to provide the large dwelling with electric power, prior to the emergence of locally available electricity (J. R. Holland and E. and H. Thompson; personal communications 1993).

PART II
ENGINEERING INFORMATION

Mercer County Bridge No. 2631 is a steel stringer bridge, reminiscent of the Pratt pony truss type. It is representative of the many small-scale metal bridges built throughout Pennsylvania and other states during the late nineteenth and early twentieth century to facilitate transportation as well as the movement of goods and raw materials between rural and urban sectors. The bridge is unusual for its use of railway iron and was built in 1894. Although the bridge manufacturer is unknown, the structure may have been built by the Lane Bridge Works of Painted Post, New York, which specialized in the fabrication of bridges using railway iron (Darnell 1984). A late nineteenth-century depiction of a Lane Bridge Works bridge on file at the Institute for the History of Technology and Industrial Archaeology in Morgantown, West Virginia, very closely resembles Mercer County Bridge No. 2631. The Lane Bridge Company structure shows a central pair of diagonal rail truss members set midway along the bridge's upper chord. Although these central diagonals are not found on Mercer County Bridge No. 2631, the structure has several non utilized threaded bolts approximately midway along the upper chord of the western bridge elevation. These may have once been used to affix a set of diagonal truss members on the western upper chord.

The construction of Mercer County Bridge No. 2631 in 1894 was part of an evolutionary trend in bridge design that emphasized reduced material requirements and stronger, improved weight-bearing capabilities. Much of the impetus for the development of metal bridge technology was related to improved railroad technology, which resulted in more efficient locomotives and substantially greater rolling stock loads. This trend led to a demand for cost-effective crossing structures capable of bearing these increased loads. By 1850, improved metallurgical technology had reduced the costs of rolled wrought iron, which was increasingly employed in the construction of all-metal bridges.

The trend toward greater reliance on all-metal bridges was hampered for a time by the disastrous collapse of a New York and Erie Railroad metal truss bridge at Laxawaxen, Pennsylvania in 1850, and by a series of railroad bridge failures which occurred at a rate of twenty-five per year during the 1870s and 1880s. These problems resulted in an increased effort to improve the quality of bridge design and structural materials. Better engineering standards and a reduction in the manufacturing cost of rolled structural steel during the 1880s resulted in the widespread use of steel bridges toward the end of the nineteenth century (Shank 1980:46-52; Encyclopedia Britannica 1955). Between the mid-nineteenth and the early twentieth century, metal truss bridges were the most common bridge type in the United States. The popularity of these all-metal truss bridges was due to the fact that they could be constructed easily and cheaply, and required no specialized skills. During the last quarter of the nineteenth century, light-gauge, low-cost, pin-connected Pratt pony truss types were among the earliest type of truss bridge built in Pennsylvania. These were especially favored in rural areas, where heavy load-bearing capacities were not required (PHMC 1986:16, 109, 126, 140). The development of the lattice panel design represents an innovation in the bridge engineering standards of the time and was part of ongoing efforts to achieve a reduction in structural material requirements, and to increase the load-bearing capacity of bridges. Mercer County Bridge No. 2631 represents an unusual example of these efforts to build bridges with reduced material requirements, using recycled railway iron.

Single-span Mercer County Bridge No. 2631 consists of an I-beam superstructure that utilizes railway iron for its upper and lower chords. The bridge rests on wingwall stone abutments, and measures 27.3 feet in length and with a cartway width of 11.75 feet. The abutments measure approximately 14 feet in length and seven feet in height and consist of six courses of elaborately dressed sandstone blocks. The timber plank deck measures 28 feet in length, 12.45 feet in width and is supported by a series of seven longitudinal steel I-beam stringers. These stringers rest on two perpendicular steel floor beams.

The upper portion of the bridge consists of a single central panel (measuring nine feet wide) and two triangular end-panels (each approximately eight feet wide). The upper chord consists of a single railway iron rail that has been bent at 45 degree angles to form the bridge's end-posts. The lower chord is also rail iron and rests directly upon the abutments and both floor beams. At each end of the bridge, the upper and lower chords are fastened together by means of threaded U-bolts. These join-points rest directly atop the abutments, without any formal bearing seat. Structural rigidity along the bridge's vertical plane is provided through a series of parallel, threaded vertical rods that loop around the bridge's upper chord and connect to each floor beam. Along each elevation, each floor beam is also connected to the upper chord by means of a single diagonal torsion rod. A series of six criss-crossing lateral braces beneath the bridge deck provides torsional strength along the bridge's horizontal plane.

Although records are incomplete, the bridge has undergone several late twentieth-century modifications. According to information furnished by the Mercer County Bridge Department, a major bridge alteration occurred in 1969 and involved the construction of a steel stringer superstructure from used beams atop the original substructure (Mercer County Bridge Department 1992). County records also indicate that used railway iron was employed to constructed a truss configuration in 1974, in an effort to increase the bridge's load-bearing capacity. According to these records, these remedial efforts were unsuccessful and the structure functions as a stringer bridge. Although no precise information was found regarding this reputed late date for incorporating railway iron, several local residents reports that the basic bridge configuration has not changed during the last 40 to 50 years (J. Holland and H. Thompson, personal communications 1993). Although the overall visual condition of the bridge is fair, several bridge deck timbers are loose and the deck appears to have dropped several inches below the level of the adjoining road.

In summary, Mercer County Bridge No. 2631 is a unusual example of the many small-scale rural bridges built throughout Pennsylvania and other states during the late nineteenth and early twentieth century to facilitate the movement of people, goods, and raw materials between rural and urban sectors. The development of these once-ubiquitous small metal bridges reflects the technological efforts of the time to improve the strength, ease of construction, and cost-effectiveness of railroad and highway bridges, using lighter and stronger materials. While most of these metal bridges were built using conventional materials, this structure was fabricated with railway iron. Although the bridge's builder and engineer are unknown, the structure is very similar to bridges designed during the late nineteenth century by the Lane Bridge Works of Painted Post, New York. The construction of Mercer County Bridge No. 2631 in 1894 represents an early public effort to improve economic and social integration of the area's numerous rural farmsteads with the nearby settlements of Hope Mills, Blacktown, and Pardoe, and with more distant economic centers, such as Pittsburgh.

SOURCES OF INFORMATION AND OTHER REFERENCES

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Note: During this recordation, no historic photographs of Mercer County Bridge 2631 were found at the Carnegie Library of Pittsburgh, Pennsylvania Division, or at the Mercer County Historical Society in Mercer, Pennsylvania.

NO. 92-615-10

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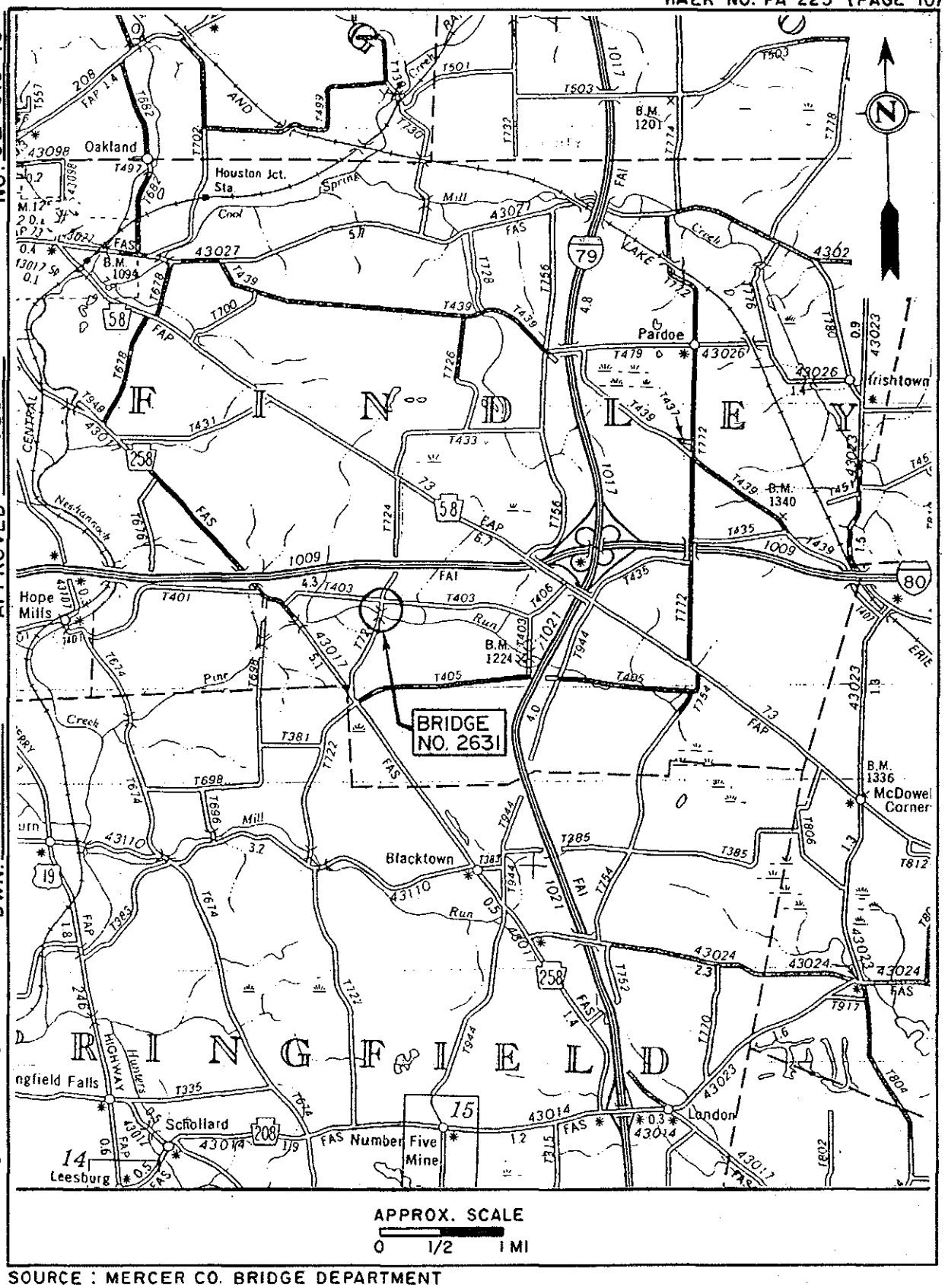

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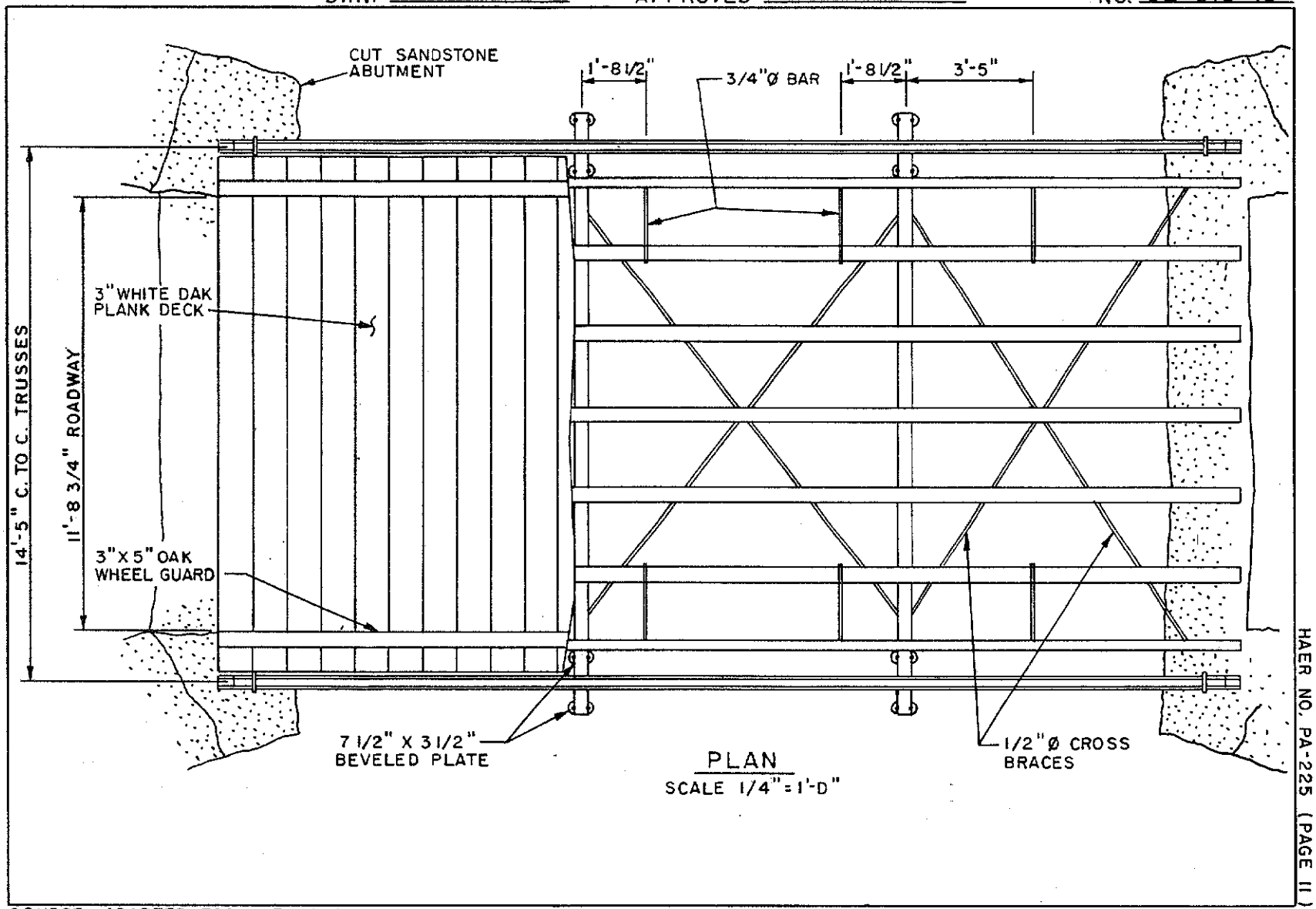

PLAN
SCALE 1/4" = 1'-0"

MERCER COUNTY BRIDGE NO. 2631
HAER NO. PA-225 (PAGE 11)

SOURCE. ADAPTED FROM DRAWING BY
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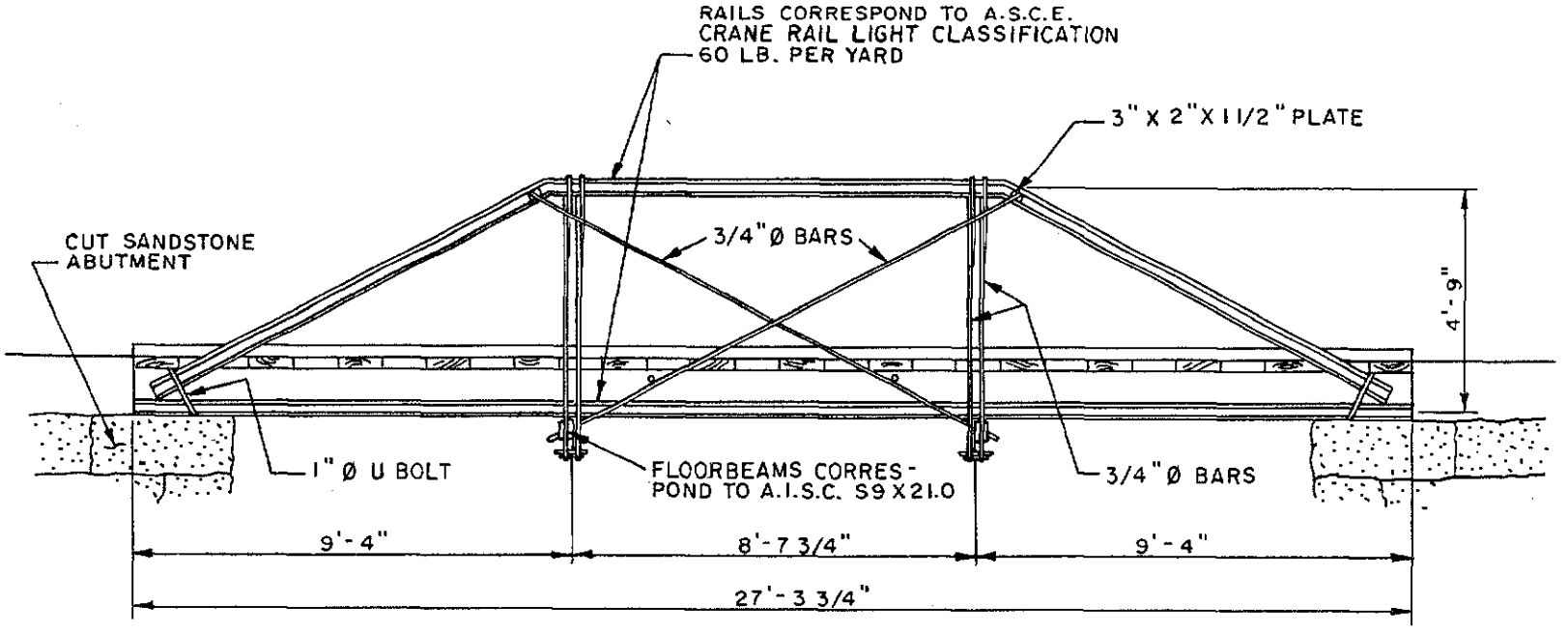

ELEVATION
SCALE 1/4" = 1'-0"

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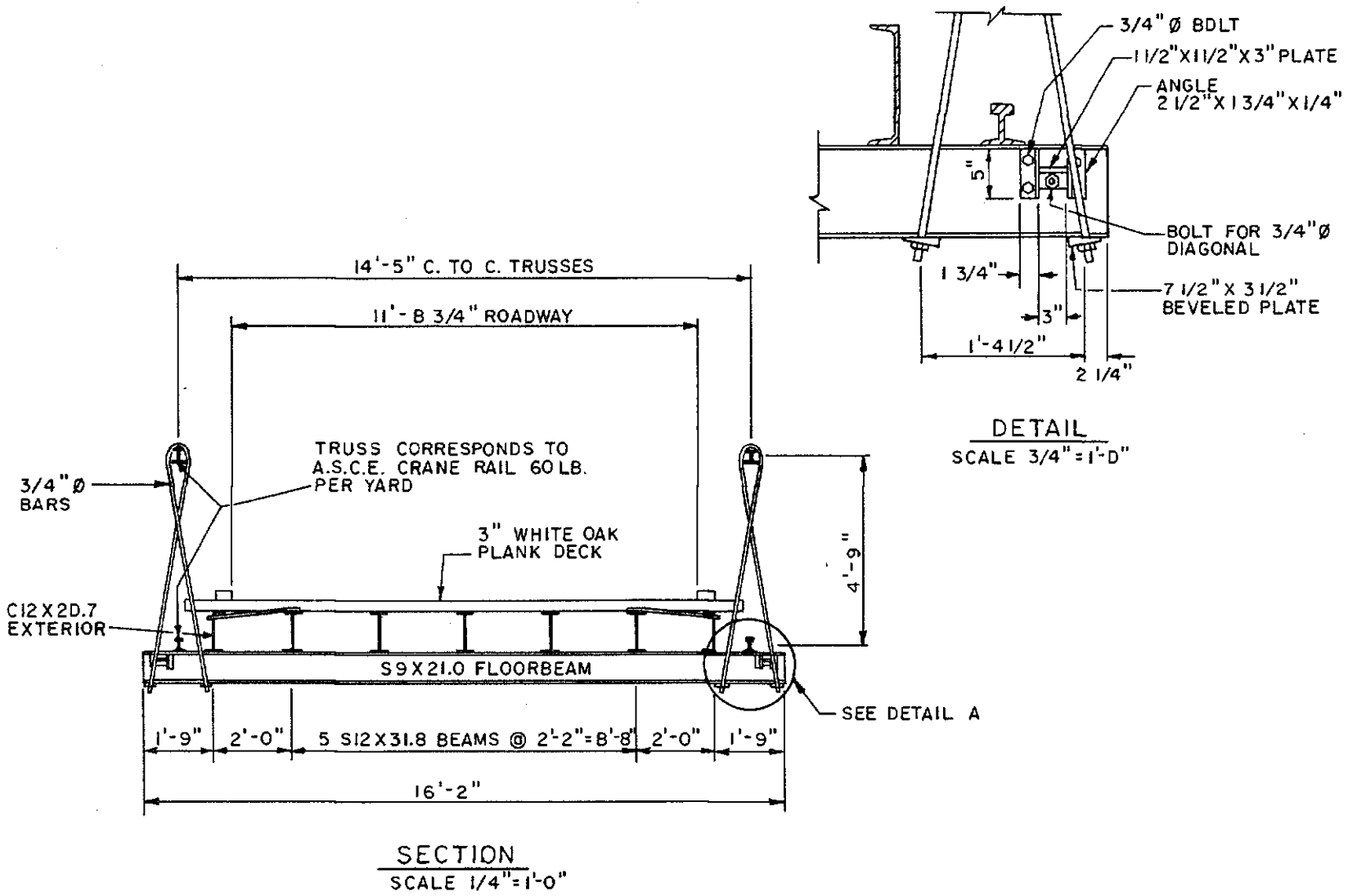

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